

Safe Crew Abort and Recovery for Ascent and Descent at the Moon and Mars

Completed Technology Project (2017 - 2018)



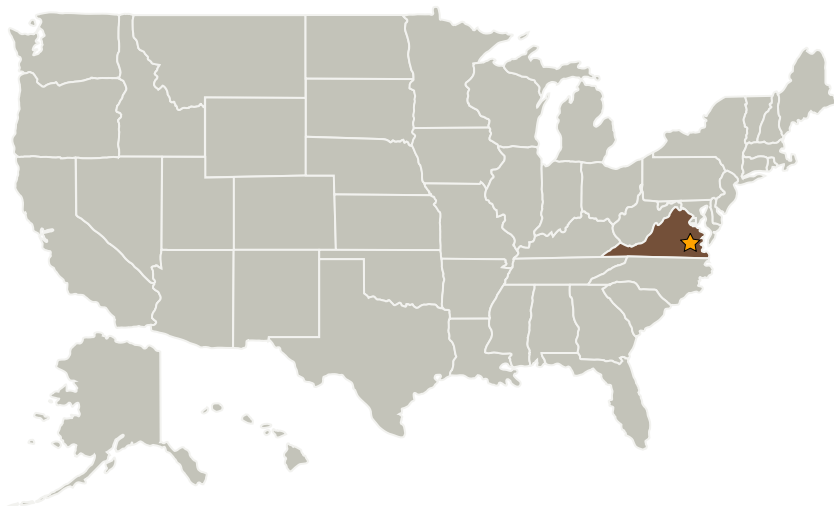
Project Introduction

Modular HSRV design includes a separable nose section with a unique propulsion system that nominally enables soft landing of the HSRV on the moon and Mars. #Nose sections are repurposable, providing crew recovery vehicle capabilities from surface or orbital nodes. #In a contingency, the HSRV nose section separates along with the crew capsule to allow either ATO or abort-to-surface (ATS). #For Mars EDL ATS scenarios, the capsule separates from the nose section and employs a HIAD, supersonic parachutes, and retropropulsion to safely land.

Anticipated Benefits

Benefit to NASA human Moon and Mars exploration missions

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Virginia



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Table of Contents


Project Introduction	1
Anticipated Benefits	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Project Website:	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Project Transitions

 **October 2017:** Project Start

 **September 2018:** Closed out

Closeout Summary: 1) Performed preliminary verification of lunar and Mars abort-to-orbit (ATO) and abort-to-surface (ATS) scenarios; complete conceptual design and sizing of crew capsule and EDL recovery systems. 2) Explored Earth applications of Hercules concept including ascent and entry aborts.

Project Website:

https://www.nasa.gov/directorates/spacetech/innovation_fund/index.html#.VC

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Innovation Fund: LaRC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Julie A Williams-byrd

Principal Investigator:

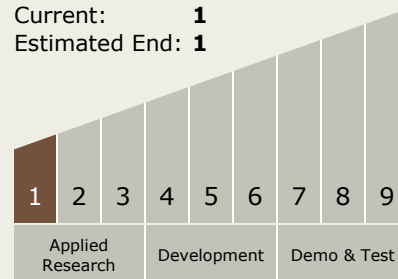
David R Komar

Technology Maturity (TRL)

Start: **1**

Current: **1**

Estimated End: **1**



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Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.1 Architecture Design and Analysis

Target Destinations

Mars, Others Inside the Solar System